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*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: COMPOSITIONS AND METHODS FOR DIAGNOSIS AND THERAPY OF CANCER

(57) Abstract: The present invention relates to a method for improved diagnosis of cervical lesions based on detection of gene products encoded by the INK4a gene locus. According to the present invention an improvement in diagnosis may be achieved by assessing the presence or absence or the level of overexpression of at least two different gene products encoded by the INK4a gene locus. In another aspect the present invention relates to peptides derived from cell cycle regulatory proteins, the expression of which is altered in association with tumors in individuals. These peptides according to the present invention may be used for detection and therapy of tumors. For detection purposes the peptides may for example be used to detect antibodies directed against said peptides. In therapeutic respect the peptides may be used for immunotherapy or vaccination approaches. In therapeutic and diagnostic respect the peptides may be used in combination with one or more peptides derived from tumor associated proteins.

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 03/50318

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G01N33/574 C07K14/47

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01N C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, EMBASE, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|-----------------------|
| X | SÁNCHEZ-AGUILERA ABEL ET AL: "p14(ARF) nuclear overexpression in aggressive B-cell lymphomas is a sensor of malfunction of the common tumor suppressor pathways." BLOOD. UNITED STATES 15 FEB 2002, vol. 99, no. 4, 15 February 2002 (2002-02-15), pages 1411-1418, XP002229639 ISSN: 0006-4971 | 25-43 |
| Y | the whole document ----- -/-- | 1-24 |

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

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04/02/2004

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| X | WO 01/040300 A (JANSEN DUERR PIDDER ;DEUTSCHES KREBSFORSCH (DE); DURO DOMINIQUE (D) 7 June 2001 (2001-06-07) page 9, paragraph 3 - page 11, paragraph 1; figure 2 | 25, 26, 28, 31-43 |
| Y | page 3, paragraph 1 | 1-14, 17-24 |
| X | WO 97/12060 A (ST JUDE CHILDRENS RES HOSPITAL) 3 April 1997 (1997-04-03) examples 3,7 page 1, line 1 - line 31 page 11, line 15 - line 23 page 16, line 19 - page 19, line 38 | 22-26, 28, 31-43 |
| Y | examples 3,7 | 1-21 |
| Y | SANO T ET AL: "EXPRESSION STATUS OF P16 PROTEIN IS ASSOCIATED WITH HUMAN PAPILLOMAVIRUS ONCOGENIC POTENTIAL IN CERVICAL AND GENITAL LESIONS" AMERICAN JOURNAL OF PATHOLOGY, PHILADELPHIA, PA, US, vol. 153, no. 6, December 1998 (1998-12), pages 1741-1748, XP001023054 ISSN: 0002-9440 the whole document | 1-24 |
| Y | WO 02/08764 A (MEDICAL RES COUNCIL ;DOORBAR JOHN (GB)) 31 January 2002 (2002-01-31) example 10 | 1-24 |

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 03/50318

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 28-33 and 38-41 are directed to/comprise a method of treatment/surgery of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☒ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Present claims 38-43 partially relate to the use of products solely defined by reference to a desirable characteristic or property, namely the ability to bind certain compounds and complexes.

The claims cover all products having this characteristic or property, whereas the application provides support within the meaning of Article 84 EPC and/or disclosure within the meaning of Article 83 EPC for only a very limited number of such products. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Independent of the above reasoning, the claims also lack clarity (Article 84 EPC). An attempt is made to define the product/compound/method/apparatus by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible. Consequently, the search has been carried out for those parts of the claims which appear to be clear, supported and disclosed, namely those parts relating to the particular binding agents mentioned in claim 34 and the peptides mentioned in claims 25-27.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 03/50318

| Patent document cited in search report | | Publication date | Patent family member(s) | Publication date |
|---|---|---------------------|--|--|
| WO 0140300 | A | 07-06-2001 | DE 19957689 A1 WO 0140300 A2 | 13-06-2001 07-06-2001 |
| WO 9712060 | A | 03-04-1997 | US 5723313 A AU 7244796 A CA 2233144 A1 EP 0853681 A1 JP 11514225 T WO 9712060 A1 US 6586203 B1 US 6172194 B1 US 6407062 B1 US 6482929 B1 US 5876965 A | 03-03-1998 17-04-1997 03-04-1997 22-07-1998 07-12-1999 03-04-1997 01-07-2003 09-01-2001 18-06-2002 19-11-2002 02-03-1999 |
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